

# NASA Technical Memorandum 89036

## INITIAL UTILIZATION OF THE CVIRB VIDEO PRODUCTION FACILITY

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CVIRB VIDEO PRODUCTION FACILITY (NASA) 46 p  
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## SUMMARY

Video disk technology is one of the central themes of a technology demonstrator workstation being assembled as a man/machine interface for the Space Station Data Management Test Bed at Johnson Space Center. Langley Research Center personnel involved in the conception and implementation of this workstation have assembled a video production facility to allow production of video disk material for this purpose. This paper documents the initial familiarization efforts in the field of video production for those personnel and that facility. Although the entire video disk production cycle was not operational for this initial effort, the production of a simulated disk on video tape did acquaint the personnel with the processes involved and with the operation of the hardware. Invaluable experience in storyboarding, script writing, audio and video recording, and audio and video editing was gained in the production process.

## INTRODUCTION

One of the primary thrusts of Langley Research Center's efforts to produce a technology demonstrator as the man/machine interface for the Space Station Data Management Test Bed at Johnson Space Center is video disk technology. This technology provides an exciting and useful method for the storage and retrieval of information. Envisioned are applications for maintenance manuals, trouble-shooting procedures, diagnostics, repair parts manuals, tutorials, and other interactive training aids. In addition to the highly interactive nature that video disk technology provides to the application (for the storage/retrieval of still and motion sequences, with and without graphics overlays), the media also allows for the storage and retrieval of all kinds of digital data, including audio, video, alphanumeric, and computer programming code. Because of these characteristics the technology is truly one of great promise. Its inclusion in the technology demonstrator workstation for the Space Station is important because of its potential to provide effective on-orbit tutorials and system maintenance aids.

Consequently, the Crew/Vehicle Interface Research Branch(CVIRB) has assembled a video production facility to allow production of video disk material for the above purposes. However, as the utilization of this equipment, as well as the production of video disk material, is a new field of endeavor for in-house personnel, a familiarization exercise was undertaken. Following this familiarization exercise, the first comprehensive application of the facility will be the production of a maintenance and trouble-shooting disk for a portion of the Environmental Control and Life Support System of the Space Station. Therefore, the familiarization exercise, as the initial utilization of the facility, was also a maintenance application. In this case, the application dealt with hardware readily available and familiar to CVIRB personnel, namely the Atari 800 desk-top personal computer in use for office automation functions within the branch.

The last steps in the production cycle, the transfer of the video material from video tape to video disk and the programming of the computer that provides the interactive control of the video disk, were not fully realized for this effort because of a delay by the manufacturer in producing the computer/video disk interface board. Therefore, a simulation of a video disk on video tape, with canned operator interaction, was the final result of this effort.

Following an explanation of the steps involved in the production of video disk applications and a description of the production facility hardware and software, this paper documents the efforts of CVIRB personnel in this initial familiarization in the field of video production.

## VIDEO DISK PRODUCTION

The steps involved in the production of video disk applications can be conveniently grouped into several main categories (reference 1). For the purposes of this discussion, those categories or phases are Analysis, Design, Production, Post-Production, Video Disk Writing, and Software Development. The chronology of the production efforts generally follow the above order of categorization. A brief description of the steps involved in each phase of production is now presented.

### Analysis Phase

Having defined the application, an analysis of the goals and needs related to the application, as well as the resources required and available to meet those goals, is conducted in order to develop strategies, objectives, schedules, and other necessary preliminary concepts.

### Design Phase

This phase of the production process translates the products of the Analysis Phase into several concrete entities, these being a storyboard, an audio script, a program flowchart, a shooting schedule, and a video script. The storyboard details the overall design of the application visually, depicting video stills and motion sequences side-by-side with required audio segments. Development of the storyboard is an iterative process which usually proceeds from an outline form to the final detailed approach to the application. The audio script is the documentation of the required audio track, or tracks, for the application. The program flowchart is a computer flowchart that details the interactive nature of the application, defining the branching network to be utilized. The shooting schedule attempts to optimize the time to be spent in the Production Phase of the effort, and it usually differs from the chronological order laid out in the storyboard. The video script details the actions required in the motion sequences of the application.

## Production Phase

The Production Phase of the effort consists of the production of art work, photos, print material, title frames, etc., and their reproduction as still frames on video tape. Motion video scripts are shot on video tape, and audio scripts are recorded on the audio channels of the video tape in the Production Phase.

## Post-Production Phase

The most time-consuming step in the video production effort is the Post-Production Phase. The editing of audio and video material involves the transfer of painstakingly-selected material from the multitudinous raw tape footage to the fully edited tape. Careful documentation in the form of edit lists for both video and audio material are essential in this process.

## Video Disk Writing Phase

Meticulous documentation concerning the transfer of images from the final edit tape to the video disk is also required during the Video Disk Writing Phase of the process. This documentation insures that the proper frame numbers are available for the computer programming effort to follow.

## Software Development Phase

The transfer of the computer flowchart into a computer program, with provisions for computer graphics overlays and interactive inputs (keyboard, voice, and/or touch), is generally the next step. Then the entry of the proper frame numbers from the video disk and the debugging and verification of the program are the final steps in the production process.

## VIDEO PRODUCTION FACILITY

Since the intent of video production efforts within CVIRB is to produce video disk software that will evaluate and demonstrate applications of the technology, output requirements of the efforts will result in single, rather than multiple, copies of the application disk. For this reason, the production facility is unconventional. The facility is geared to produce a single disk, with the capability of iteratively changing that disk should the need arrive. (The envisioned applications will not require the entire capacity of a disk, thus enabling rewrites and reprogramming on empty frames.) A brief description of the facility (see figure 1) is now presented.

## Production Software System

Two independent software systems, both aimed at video production, exist within the video production facility. The first consists of a set of PC-based

programs (the PC is connected to the editing controller):

(a) A script writing program , based on a professional word processor, specifically oriented towards video scriptwriters, where single-keystroke function keys automatically identify camera action and set directions, narratives, outline, and table of content items. The formatter portion reads this script and performs all mechanical formatting. For video scripts, camera directions and narratives are formatted into two columns, with VIDEO: and AUDIO: headings and page numbers automatically set by the program.

(b) An off-line edit decision list compiler and manager. The decision list compiler takes the place of paper edit log forms, resulting in two major benefits: entering time code numbers on the computer is faster and neater than using paper forms, and the computer will keep track of record-in times, a task that is very difficult using paper logs. The list manager loads an existing edit decision list from a previous editing session, and it is used to perform list management off-line.

The second software system is centered around a PC-based video disk development system. This development system is used to develop the interactive video disk program, as well as the generation of computer graphic images for video overlay. The software system is contained in a unique, icon-driven user environment that allows the program developer quick and easy access (via a touch screen or mouse) to the powerful software tools. These software tools include :

(a) System software that supports, via software interfaces, various language/authoring environments and provides hardware independence to application programs. This hardware independence prevents application programs from becoming obsolete when new video disk players become available. Also, it provides commands that are not available on most players, such as PLAYTO, which plays the video disk until a target frame is reached, and GETFRAME, which returns the current frame number. These commands work on all players, even those not designed to support them. Hardware independence is extended to the provision for application programs to accept input from a variety of X/Y input devices, such as a mouse, touch screen, graphics tablet, etc. Coordinate scaling and hardware communications issues are transparent to the user.

(b) A command interpreter that permits program developers to interactively write and test program modules and convert them to source code.

(c) Graphics creation software. The software system provides functions for graphics image management and manipulation. Created graphics can be loaded into memory, displayed alone or overlaid on the video disk image, moved and edited, all under program control using the same command set.

(c) Disk operating system that uses a tree-structured filing system.

(d) Various program utilities, including touchscreen selection zone creation, image file maintenance, and video disk control.

## Video Disk Recorder/Player

The video disk recorder comprises part of the video disk development system. It is worthy of separate mention because of the DRAW (Direct Read After Write) technology involved. This capability for recording an on-line video image enhances greatly the production time as well as decreasing production costs for a single video disk. The alternate method for video disk image creation requires expensive disc mastering and pressing techniques that is more viable for multiple (hundreds/thousands) disc creation where distribution is required.

The DRAW-type video disk recorder utilizes laser/optical recording and playback techniques in which a more intense laser beam is used for recording purposes and a less intense laser beam is used for playback. This DRAW-type videodisc recorder, although having less frames per disc than a standard mastered disc (24,000 frames vs. 54,000), has a faster maximum frame access time (.5 sec as opposed to 1.5 sec). This is also inherent in the disc size, where DRAW technology discs are 8 inches in diameter in contrast to the 12 inch diameter of standard format discs. It is expected that production costs will decrease even further once erasable video disk technology becomes available.

## Audio/Video Recording Hardware

The hardware required to produce the initial unedited master video tape is a portable video recorder, shoulder held camera, and lights (all of which can be battery powered). There is a need in many instances for a tripod or a copy stand to provide a steady mount for the camera. This equipment is in the category of "broadcast quality" (suitable for national broadcast use).

With this equipment, audio information can be recorded simultaneously with the video, or a separate narrated audio tape can be produced. Either of these methods require time code information to be present on the tape for editing purposes. Time code is a method of numbering each frame to allow for accurate editing of the audio/video information.

## Video Editing Suite

The editing of the master video tape to produce a final production tape is accomplished utilizing a video editing suite. The minimum hardware required in a video editing suite includes a source and a record video tape machine, a time base corrector/frame synchronizer, an editor controller, source and record monitors, a status monitor, a waveform monitor, and a vector scope.

The master video tapes are reviewed, utilizing the source recorder, edit controller, source monitor, and status monitor, prior to the final editing, and a decision list is produced. This list enables the editor to accurately edit the video tape using the time code on the tape. The edit controller has the ability to abruptly end a screen or to provide a soft fade to black. Master tapes can be edited to achieve a variety of techniques, including: (1) multiple still frames and (2) motion sequences.

## THE INITIAL PRODUCTION

The initial production effort resulted in a simulation of a video disk on video tape, with canned operator interaction, rather than an actual video disk with true user interaction capability. This simulation was necessitated because the last steps in the production cycle, the transfer of the video material from video tape to video disk and the programming of the computer that provides the interactive control of the video disk, were not fully operational. A delay by the manufacturer in producing the computer/video disk interface board has been encountered, and yet the Space Station workstation schedule requires immediate experience with the production cycle. Therefore, the final two phases of the cycle, the Video Disk Writing and Software Development Phases, were omitted from this effort.

### Analysis Phase

After the familiarization project, the facility will be applied to the production of a maintenance and trouble-shooting disk for a portion of the Environmental Control and Life Support System of the Space Station. Therefore, the familiarization exercise was chosen also to be a maintenance application. In this case, the application dealt with hardware readily available and familiar to CVIRB personnel, namely the Atari 800 desk-top personal computer in use for office automation functions within the branch.

The approach strategy adopted for the maintenance application was to allow selection of a maintenance procedure from a menu of procedures and then to demonstrate the procedure in a continuous mode, showing the overall process. The courseware would then allow the user to advance through the procedure one step at a time, with pauses between steps to allow the operator to complete the step on his own equipment. All selections would, of course, be predetermined in the simulation, and all pauses between steps would be of short, predetermined length.

### Design Phase

The Design Phase of the effort centered on the iterative definition of the storyboard. That is, the initial storyboard began as a bare outline, from which the computer flowchart was generated. The flowchart construction revealed some desired changes in the storyboard. These changes were made. A video script was then created and added to the storyboard. Again, changes to the storyboard were suggested in the process of creating the video script, and those changes were incorporated into both the storyboard and the flowchart. The audio script was then written, and again changes were made throughout the entire array until the final full storyboard had been assembled. The last step in the Design Phase was the construction of the shooting schedule based on the completed storyboard.

Figure 2 presents the final version of the storyboard, but in the initial storyboard form, as a bare outline. Figure 3 illustrates the schematic notations used for the purposes of this paper in the computer program flowchart to be found in figure 4. Figure 5 presents the completed storyboard, with the audio and video scripts included within it. The shooting schedule is found in figure 6.

### Production Phase

The audio script was recorded first, and the time duration of each segment was carefully measured. These durations were noted in the video script to ensure that enough video would be shot for the corresponding audio tracks. Two video shootings were executed, with the first serving as a dress rehearsal for the second. The still frames were then produced on the computer with the graphics program, and those stills to be overlaid on video were then recorded. At the conclusion of the Production Phase, three sources for the editing process had been assembled: an audio source, a motion video source, and a stills source.

### Post-Production Phase

Reviewing and selecting the portions of source material to be utilized in the final product of the production process required much effort, while the actual transfer of material from the sources to the edited tape was facilitated by the performance characteristics of the editing suite. An outgrowth of the documentation procedures developed during the editing sessions was an assembly script, presented as figure 7. This script, which will be used in future CVIRB production efforts, provides a concise form for recording the information usually contained in separate edit lists.

An interesting issue arose during the edit process concerning the order of audio production, which traditionally is recorded before the video sequences are shot. The audio script in some instances described actions being carried out in real-time by an actor, and pauses were provided in the creation of the audio script to allow for completion of that action. The editing process often involved the lengthening or shortening of these pauses to coordinate the audio and video, which, while not difficult, seemed more cumbersome than simply recording, or rerecording, the audio segment while viewing the video sequence.

### CONCLUSIONS

Although the entire video disk production cycle was not operational for this initial effort, the production of a simulated disk did acquaint CVIRB personnel with the processes involved and with the operation of the hardware. The exposure to the iterative procedures of storyboarding was particularly enlightening, as was the verification of the time-consuming nature of the editing task. Aside from the creation of the assembly script, and the notion of rerecording audio segments for easier coordination with video segments, the effort was a straight forward application of conventional techniques. However,



the experience gained in storyboarding, script writing, audio and video recording, and audio and video editing was invaluable as preparation for future video production efforts.

#### REFERENCES

1. Daynes, Rod; Editor. "The Videodisk Book: A Guide and Directory."  
Wiley and Sons, Inc., New York, 1984.

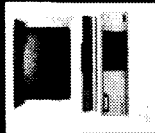
# C/VIRB VIDEO PRODUCTION FACILITY



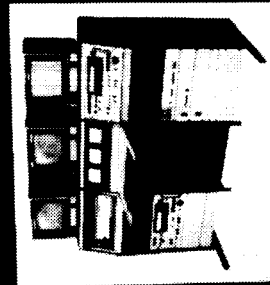
IBM  
PC/XT



COPY STAND



VISAGE VIDEODISC  
DEVELOPMENT SYSTEM



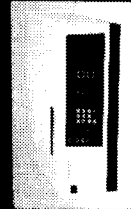
VIDEO EDITING SUITE



PORTABLE VCR



UNEDITED TAPE



DRAW UNIT  
VIDEODISC RECORDER



8" VIDEODISC  
PRODUCT



BROADCAST QUALITY  
STUDIO CAMERA

Figure 1.- CVIRB Video Production Facility.

SEGMENT #	TITLE	DESCRIPTION	STILL	AUDIO	VIDEO
1	Introduction	Title slide with audio introduction			
	S100 Title Slide	A100 Introduction			Overlay S100 with view of computer system

SEGMENT #	TITLE	DESCRIPTION	STILL	AUDIO	VIDEO
2	PROBLEM PROMPT	Menu of problems covered with audio prompt			
	I100 Menu Slide	A110 Select Prompt			N/A

SEGMENT #	TITLE	DESCRIPTION	STILL	AUDIO	VIDEO
3	Memory Check Procedure	Title of selected problem			
	S200 Procedure Title	N/A			N/A

Figure 2.- Raw Storyboard.

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SEGMENT #	TITLE	DESCRIPTION
4	Play Option Prompt	Continuous or Step-by-Step Procedure Selection = Continuous
	STILL	AUDIO
	I 200	N/A
	Menu Slide	Select Prompt

SEGMENT #	TITLE	DESCRIPTION
5	Run Diagnostic Test	Title of Procedure
	STILL	AUDIO
	S 300	N/A
	Procedure Title	Begin Continuous Description of Procedure

SEGMENT #	TITLE	DESCRIPTION
6	Diagnostic Test	Continuous Segment of Procedure
	STILL	AUDIO
	N/A	M 310
		Continuous Procedure Motion Segment

Figure 2.- Continued.

SEGMENT #	TITLE	DESCRIPTION		
7	END TEST	End of Diagnostic Test		
	STILL	AUDIO	VIDEO	
	N/A	A 230 ends	M 301 motion segment showing Diagnostic message	

SEGMENT #	TITLE	DESCRIPTION		
8	Power Down Procedure	Title of Procedure		
	STILL	AUDIO	VIDEO	
	5400 Procedure Title	N/A	N/A	

SEGMENT #	TITLE	DESCRIPTION		
9	Power Down	Power Down + disconnect, continuous		
	STILL	AUDIO	VIDEO	
	N/A	A 140 Continuous Description of Procedure	M 400 motion segment showing power down + cable disconnect	

SEGMENT #	TITLE	DESCRIPTION	
10	Tools Required	Title of Procedure	
	STILL	AUDIO	VIDEO
	5500	N/A	N/A
	Procedure Title		

SEGMENT #	TITLE	DESCRIPTION	
11	Pick Tool	Show array of tools + select screw driver	
	STILL	AUDIO	VIDEO
	N/A	A150	M1500
		Description of tools needed	motion segment showing tool selection

SEGMENT #	TITLE	DESCRIPTION	
12	Board Access	Title of Procedure	
	STILL	AUDIO	VIDEO
	5600	N/A	N/A
	Procedure Title		

Figure 2.- Continued.

SEGMENT #	TITLE	DESCRIPTION	
13	Board Removal	Remove computer top & then board	
	STILL	AUDIO	VIDEO
	N/A	A160 Description of access & removal	M600 Motion segment of procedure

SEGMENT #	TITLE	DESCRIPTION	
14	Board Replacement	Title of Replacement Procedure	
	STILL	AUDIO	VIDEO
	S700 Procedure Title	N/A	N/A

SEGMENT #	TITLE	DESCRIPTION	
15	Replacement Procedure	Show memory board & then insertion in computer	
	STILL	AUDIO	VIDEO
	N/A	A170 Description of memory board replacement	M700 Motion segment of procedure

SEGMENT #	TITLE	DESCRIPTION	STILL	AUDIO	VIDEO
16	Reconnect System	Title of Procedure			
	5800	N/A			N/A
	Procedure Title				
SEGMENT #	TITLE	DESCRIPTION	STILL	AUDIO	VIDEO
17	Reconnect Procedure	show hook-up procedure			
	N/A	A 280 Description of hook-up + ending to continuous play option			M 800 Motion segment of procedure
SEGMENT #	TITLE	DESCRIPTION	STILL	AUDIO	VIDEO
18	END CONTINUOUS	show computer system			
	N/A	A 280 ends			M 900 Motion segment panning reconnected system

Figure 2.- Continued.



SEGMENT #	TITLE	DESCRIPTION	
19	Play Option Prompt	Continuous or Step-by-Step Procedure Selection = Step-by-Step	VIDEO
	I 200	A 110	N/A
	Menu Slide	Select Prompt	

SEGMENT #	TITLE	DESCRIPTION	
20	RUN DIAGNOSTIC TEST	Step-by-Step Title of Procedure	VIDEO
	S 300	A 130	N/A
	Procedure Title	Begin Step-by-Step Description	

SEGMENT #	TITLE	DESCRIPTION	
21	Diagnostic Test	Step-by-Step Diagnostic Test	VIDEO
	N/A	A 130	M 300
			Step-by-Step Motion Segment

SEGMENT #	TITLE	DESCRIPTION	
22	End Test	End of Diagnostic Test	
	STILL	AUDIO	VIDEO
	N/A	A 135 Step-6, -Step Test Ending	M 301 Motion segment showing Diagnostic Message

SEGMENT #	TITLE	DESCRIPTION	
23	Continue Prompt	Still to prompt "return" to continue	
	STILL	AUDIO	VIDEO
	550 Hit "return" Slide	N/A	N/A

SEGMENT #	TITLE	DESCRIPTION	
24	Memory Check Results	Menu of possible results of test	
	STILL	AUDIO	VIDEO
	I 300 Menu Slide	A 110 Select Prompt	N/A

Figure 2.- Continued.

SEGMENT #	TITLE	DESCRIPTION	STILL	AUDIO	VIDEO
25	Power Down Procedure	Title of Procedure			
	5400				
	Procedure Title			N/A	N/A

SEGMENT #	TITLE	DESCRIPTION	STILL	AUDIO	VIDEO
26	Power Down	Power down + disconnect			
	N/A			A140	M400
		Procedure Description			Motion Segment

SEGMENT #	TITLE	DESCRIPTION	STILL	AUDIO	VIDEO
27	Continue Prompt				
	550				
	Hit "return"			N/A	N/A
	Slide				

Figure 2.- Continued.

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SEGMENT #	TITLE	DESCRIPTION	STILL	AUDIO	VIDEO
28	Tools Required	Title of Procedure			
	5500				
	Procedure Title	N/A			N/A

SEGMENT #	TITLE	DESCRIPTION	STILL	AUDIO	VIDEO
29	Pick Tool	Show array of tools + select screwdriver			
	N/A				
		Description of tools needed		A150	M500
					motion segment

SEGMENT #	TITLE	DESCRIPTION	STILL	AUDIO	VIDEO
30	Continue Prompt				
	5550				
	Hit "return"				
	slide				
		N/A			N/A

Figure 2.- Continued.

SEGMENT #	TITLE	DESCRIPTION
31	Board Access	Title of Procedure
	STILL	AUDIO
	5600	N/A
	Procedure Title	N/A

SEGMENT #	TITLE	DESCRIPTION
32	Board Removal	Remove Computer top + then board
	STILL	AUDIO
	N/A	A160
		Description of access + removal
		Motion Segment of procedure

SEGMENT #	TITLE	DESCRIPTION
33	Continue Prompt	
	STILL	AUDIO
	550	N/A
	Hit "return"	
	Slide	

SEGMENT #	TITLE	DESCRIPTION	
34	Board Replacement	Title of Procedure	
	STILL	AUDIO	VIDEO
	5700	N/A	N/A
	Procedure Title		

SEGMENT #	TITLE	DESCRIPTION	
35	Replacement Procedure	Insertion of Memory board	
	STILL	AUDIO	VIDEO
	N/A	A170	M700
		procedure description	motion segment

SEGMENT #	TITLE	DESCRIPTION	
36	Continue Prompt		
	STILL	AUDIO	VIDEO
	550	N/A	N/A
	Hit "return"		
	Slide		

Figure 2.- Continued.

SEGMENT #	TITLE	DESCRIPTION
37	Reconnect System	Title of Procedure
	STILL	AUDIO VIDEO
	5800	
	Procedure	
	Title	
	N/A	N/A

SEGMENT #	TITLE	DESCRIPTION
38	Reconnect Procedure	Slow hook-up, step by-step ending
	STILL	AUDIO VIDEO
	N/A	
	A180	
	Description of hook-up + ending to step-by-step play option	Motion Segment
		M800

SEGMENT #	TITLE	DESCRIPTION
39	End Step-by-Step	Ready to check memory again
	STILL	AUDIO VIDEO
	A180 and 5	
		Motion Segment panning system
		M900

SEGMENT #	TITLE	DESCRIPTION	AUDIO	VIDEO
40	Continue Prompt			
	550		N/A	N/A
	Hit "return"			
	to continue			

SEGMENT #	TITLE	DESCRIPTION	AUDIO	VIDEO
41	Memory Check Procedure	Title of procedure		
	5200		N/A	N/A
	Procedure Title			

SEGMENT #	TITLE	DESCRIPTION	AUDIO	VIDEO

Figure 2.- Concluded.



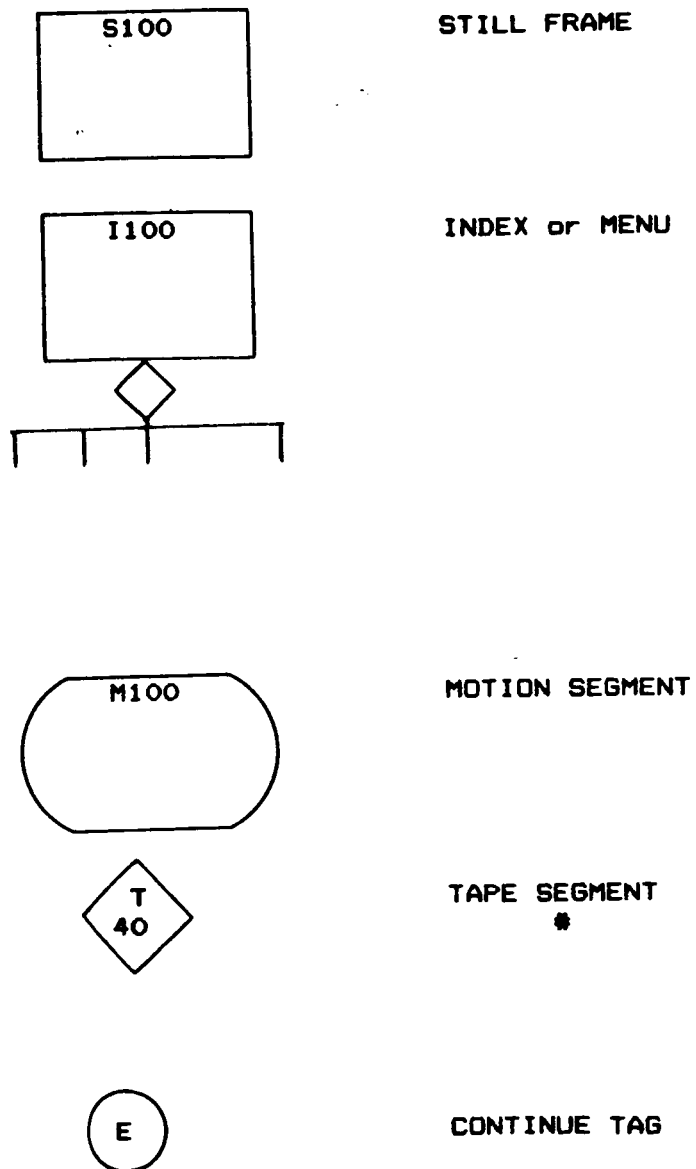
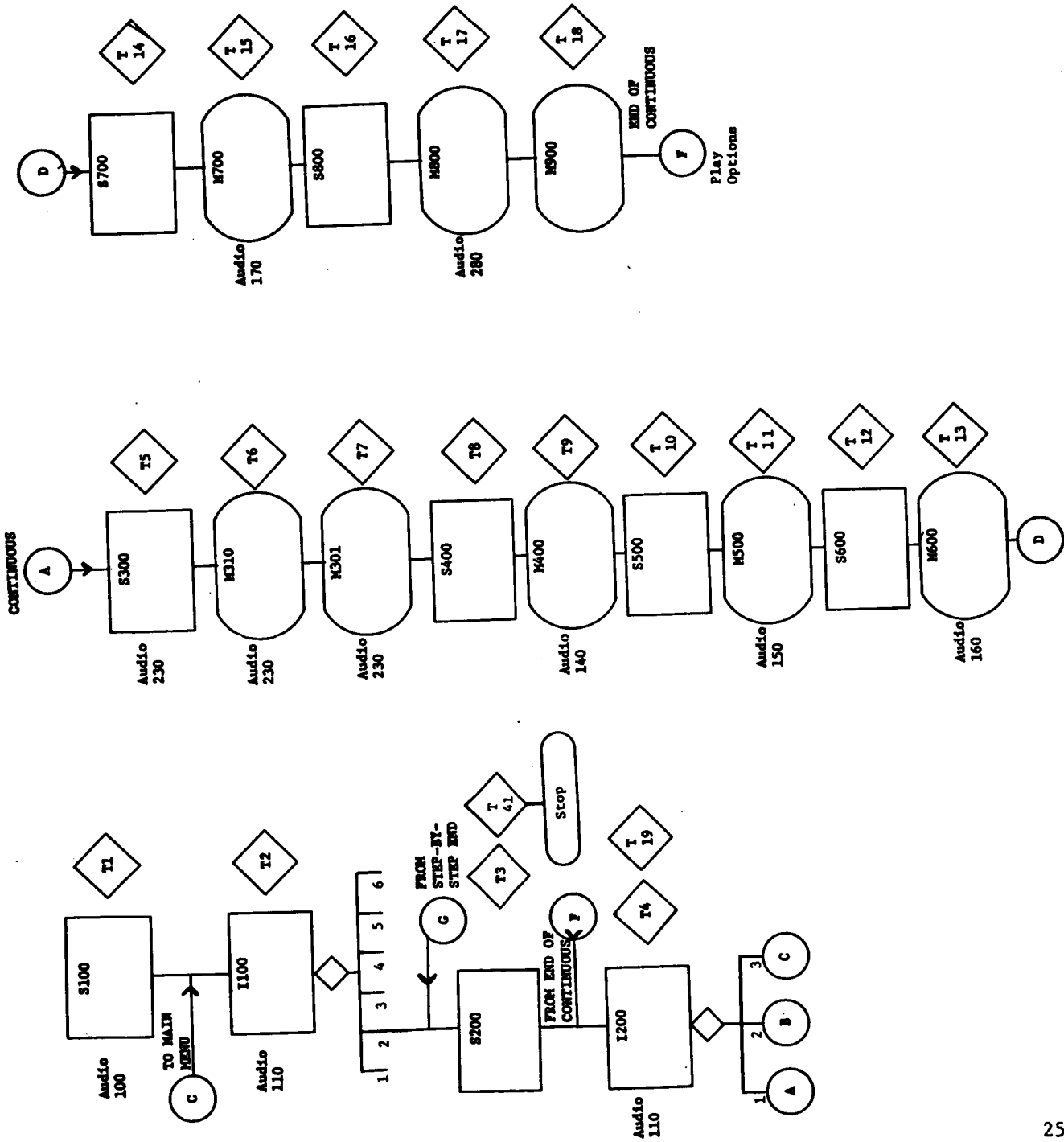


Figure 3.- Schematic notations used in computer flowchart.

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**Figure 4.- Computer flow chart.**

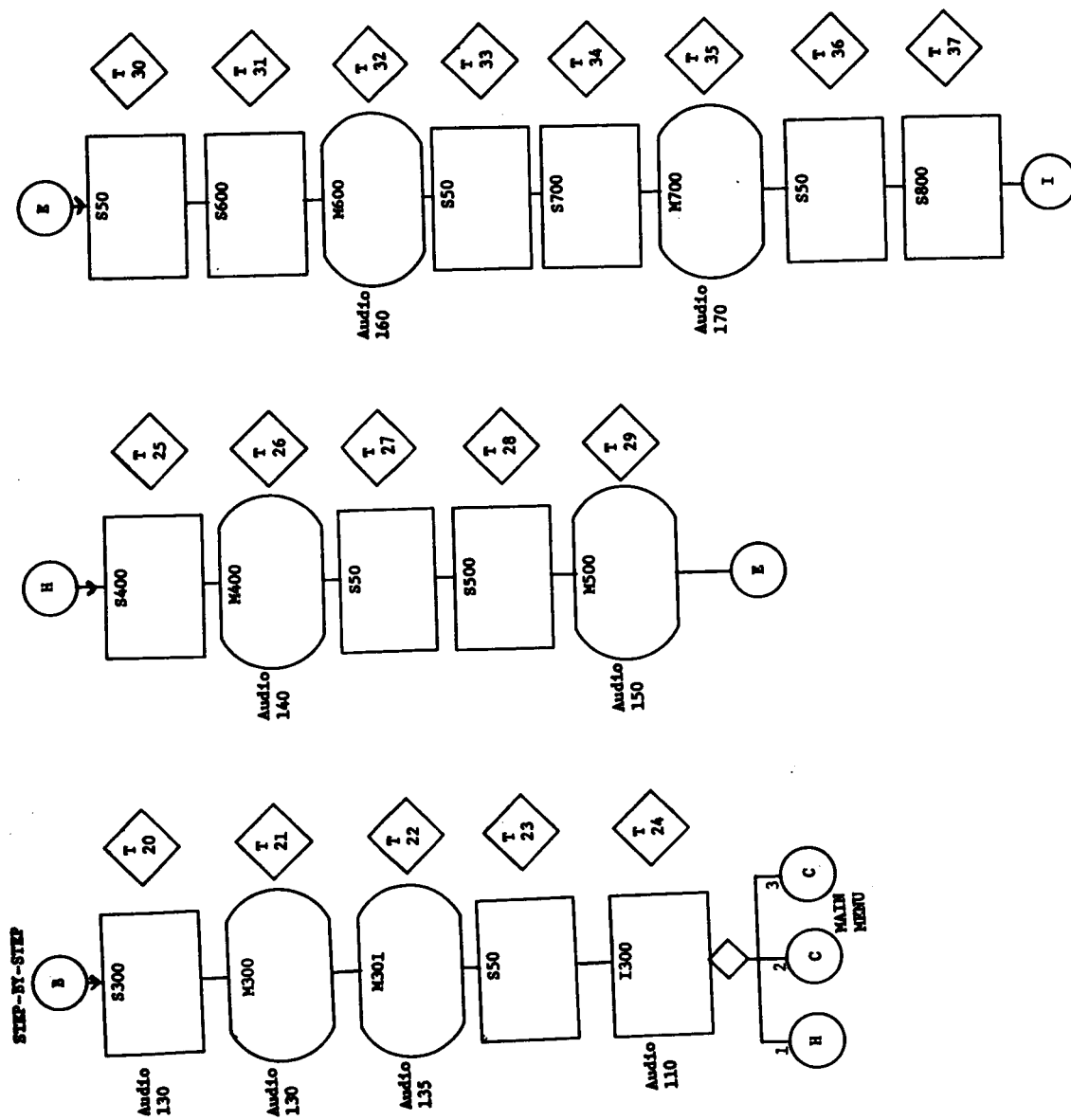


Figure 4.- Continued.

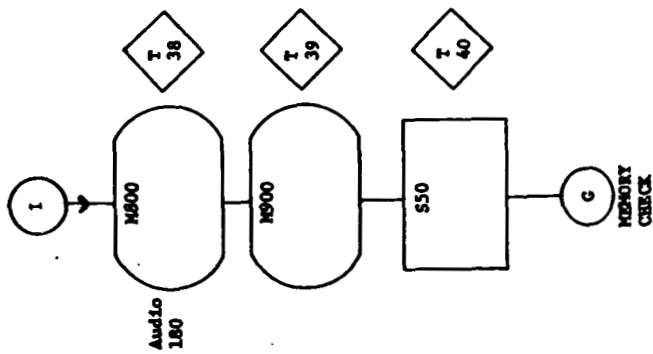


Figure 4.- Concluded.

SEGMENT #	TITLE	DESCRIPTION
1	Introduction	Title slide with audio introduction
	STILL	AUDIO
	VIDEO	
	<div> <div>8100</div> <div>ATARI</div> <div>TROUBLE-SHOOTING!</div> <div>&amp;</div> <div>MAINTENANCE</div> <div>PROCEDURES</div> </div>	<div> <div>INTRODUCTION</div> <div> <p>THIS VIDEO TAPES MEN PROVIDED AS A FORTIFICATION, REPAIRING, TROUBLE SHOOTING, MAINTENANCE, AND AUDIO AND VIDEO EDITING, AND BEEN ADVISED IN THE PROGRAM.</p> </div> </div>
		Overlay 5100 with view of computer system
2	PROBLEM PROMPT	Menu of problems covered with audioprompt
	STILL	AUDIO
	VIDEO	
	<div> <div>1100</div> <div>SUSPECTED PROBLEM!</div> <div>1. DISK DRIVE</div> <div>2. MEMORY BOARD</div> <div>3. ROM BOARD</div> <div>4. KEYBOARD</div> <div>5. SOUND</div> <div>6. VIDEO</div> </div>	<div> <div>STANDARD MENU AUDIO PROMPT</div> <div> <p>STANDARD MENU AUDIO PROMPT</p> <p>PLEASE YOUR SELECTION AT THIS TIME, PLEASE.</p> </div> </div>
		N/A
3	Memory Check Procedure	Title of selected Problem
	STILL	AUDIO
	VIDEO	
	<div> <div>8200</div> <div>MEMORY</div> <div>CHECK</div> <div>PROCEDURE</div> </div>	<div> <div>N/A</div> </div>
		N/A
		Procedure Title

2/8

N/A

A230 ↓

29

SEGMENT #	TITLE	DESCRIPTION
7	END TEST	End of Diagnostic Test
	STILL	VIDEO
	N/A	<p>END DIAGNOSTIC TEST</p> <p>start stop</p> <p>actual 10 MIN 10 MIN DISPLAY</p> <p>NOTION 301</p> <p>min</p>

SEGMENT #	TITLE	DESCRIPTION
8	Power Down Procedure	Title of Procedure
	STILL	AUDIO
	<p>8400</p> <p>POWER DOWN PROCEDURE</p> <p>Procedure Title</p>	N/A

SEGMENT #	TITLE	DESCRIPTION
9	Power Down	Power Down + disconnect, continuous
	STILL	AUDIO
	N/A	<p>POWER DOWN/DISCONNECT</p> <p>start stop</p> <p>actual 10 MIN 10 MIN DISPLAY</p> <p>NOTION 400</p> <p>min</p>

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SEGMENT #	TITLE	DESCRIPTION	STILL	AUDIO	VIDEO
10	Tools Required	Title of Procedure	<div> <div>S500</div> <div>TOOLS REQUIRED</div> </div>	N/A	N/A

SEGMENT #	TITLE	DESCRIPTION	STILL	AUDIO	VIDEO
11	Pick Tool	Show array of tools + select screw driver	N/A	<p>TOOL SELECTION</p> <p>STOP</p> <p>PHILLIPS HEAD SCREW DRIVER IS PROPERLY SIZED WILL BE PRESENTED FOR THE NEXT STEP IN THE PROCESS.</p>	<p>TOOL SELECTION</p> <p>STOP</p> <p>PHILLIPS HEAD SCREW DRIVER IS PICK UP A PHILLIPS HEAD SCREW DRIVER</p>

SEGMENT #	TITLE	DESCRIPTION	STILL	AUDIO	VIDEO
12	Board Access	Title of Procedure	<div> <div>S600</div> <div>BOARD ACCESS &amp; REMOVAL</div> </div>	N/A	N/A

Figure 5.- Continued



SEGMENT #	TITLE	DESCRIPTION
13	Board Removal	Remove computer top & then board
	STILL	VIDEO
	N/A	<p>LOVEN AND BOARD REMOVAL</p> <p>start stop min</p> <p>actual 0 DEULTORIAL VIEW OF OPEN THE COVER AND REMOVE THE TWO SCREWS</p> <p>start stop min</p> <p>actual 0 REMOVE THE COVER</p> <p>start stop min</p> <p>actual 0 THE PHUSPLEN MAND MAY BE REMOVED.</p>

SEGMENT #	TITLE	DESCRIPTION
14	Board Replacement	Title of Replacement Procedure
	STILL	VIDEO
	<p>S700</p> <p>BOARD REPLACEMENT</p>	N/A

SEGMENT #	TITLE	DESCRIPTION
15	Replacement Procedure	Show memory board & then insertion in computer
	STILL	VIDEO
	N/A	<p>LOVEN AND BOARD REMOVAL</p> <p>start stop min</p> <p>actual 0 ANOTHER MEMORY MAND SHOULD BE INSERTED IN THE EMPTY SLOT</p> <p>start stop min</p> <p>actual 0 REPLACES COVER</p> <p>start stop min</p> <p>actual 0 REPLACING THE TWO SCREWS</p>

SEGMENT #	TITLE	DESCRIPTION
18	END CONTINUOUS	Show computer system

STILL	AUDIO	VIDEO
N/A	A280 ↓ ends	

MOTION PICTURE SYSTEM

start stop

actual time system

SEGMENT #	TITLE	DESCRIPTION
19	Play Option Prompt	Continuous or Step-by-Step Procedure Selection = Step-by-Step
	STILL	AUDIO
	1200	DIAGNOSTIC MENU AUDIO PROMPT
	PLAY	START VIDEO SELECTION AT THIS TIME, PLEASE.
	OPTIONS	
	1. CONTINUOUS	
	2. STEP-BY-STEP	
	3. RETURN TO	
	MAIN MENU	
		N/A
		VIDEO
20	RUN DIAGNOSTIC TEST	Step-by-Step Title of Procedure
	STILL	AUDIO
	5300	DIAGNOSTIC TEST (STEP BY STEP)
	RUN	START STEP IN INHABIT UNLESS A SUSPENDED PROMPT PROMPT IS RECEIVED UP. HANGING A DIAGNOSTIC PROMPT. PUNCH THE SYSTEM UP, WITH THE DISK DRIVE ON
	DIAGNOSTIC	STOP
	TEST	SEE PALMS TO SEE AND THE COMPUTER UP
		STOP
		SEE PALMS TO SEE AND THEN INSERT THE DISK WITH THE DIAGNOSTIC PROGRAM INTO THE DRIVE
		STOP
		SEE PALMS TO SEE AND THE DRIVE DARK
		STOP
		SEE PALMS TO SEE AND TURN THE COMPUTER ON
		STOP
		SEE PALMS TO SEE AT THE READY PROMPT, WITH THE PROGRAM.
		N/A
		VIDEO
21	Diagnostic Test	step-by-Step
	STILL	AUDIO
		DIAGNOSTIC TEST (STEP BY STEP)
		START STEP IN INHABIT UNLESS A SUSPENDED PROMPT PROMPT IS RECEIVED UP. HANGING A DIAGNOSTIC PROMPT. PUNCH THE SYSTEM UP, WITH THE DISK DRIVE ON
		STOP
		SEE PALMS TO SEE AND THE COMPUTER UP
		STOP
		SEE PALMS TO SEE AND THEN INSERT THE DISK WITH THE DIAGNOSTIC PROGRAM INTO THE DRIVE
		STOP
		SEE PALMS TO SEE AND THE DRIVE DARK
		STOP
		SEE PALMS TO SEE AND TURN THE COMPUTER ON
		STOP
		SEE PALMS TO SEE AT THE READY PROMPT, WITH THE PROGRAM.
		N/A
		VIDEO

Figure 5.- Continued.

SEGMENT #	TITLE	DESCRIPTION
22	End Test	End of Diagnostic Test
	STILL	AUDIO VIDEO
N/A		<p>END DIAGNOSTIC TEST STOP START DIAGNOSTIC PROGRAM WILL INDICATE WHEN MAJOR REPAIRS IF THERE IS A PROBLEM.</p> <p>AUDIO 135</p> <p>MOTION 303</p> <p>start . . . stop . . . actual . . . empty in the screen display</p>

SEGMENT #	TITLE	DESCRIPTION	STILL	AUDIO	VIDEO
23	Continue Prompt	Still to prompt "return" to continue	<div> <div>550</div> <div> HIT  "return" OR  SAY  "page"  TO CONTINUE </div> </div>	N/A	N/A

SEGMENT #	TITLE	DESCRIPTION
24	Memory Check Results	Menu of possible results of test
	STILL	AUDIO VIDEO
	I300	
	MEMORY CHECK RESULTS	
	1. DETECTS FAILURE	
	2. ALL PASS	
	3. RETURN TO MAIN MENU	
		N/A

SEGMENT #	TITLE	DESCRIPTION
25	Power Down Procedure	Title of Procedure
	STILL	AUDIO
	<div> <div>S400</div> <div>POWER DOWN PROCEDURE</div> </div>	N/A
		N/A
26	Power Down	Power down + disconnect
	STILL	AUDIO
	N/A	<div> <div> <div> <div>START</div> <div>STOP</div> </div> <div> <div>START</div> <div>STOP</div> </div> <div> <div>START</div> <div>STOP</div> </div> <div> <div>START</div> <div>STOP</div> </div> <div> <div>START</div> <div>STOP</div> </div> </div> <div> <div>TURN ON MAIN/DISCONNECT</div> <div>TURN ON MAIN/DISCONNECT</div> <div>TURN ON MAIN/DISCONNECT</div> <div>TURN ON MAIN/DISCONNECT</div> <div>TURN ON MAIN/DISCONNECT</div> </div> </div>
		N/A
27	Continue Prompt	
	STILL	AUDIO
	<div> <div>S50</div> <div>HIT "return" OR SAY "page" TO CONTINUE</div> </div>	N/A
		N/A

Figure 5.- Continued.

SEGMENT #	TITLE	DESCRIPTION
28	Tools Required	Title of Procedure
	STILL	AUDIO
	VIDEO	
	<div style="border: 1px solid black; padding: 5px;">           S500            TOOLS            REQUIRED         </div>	N/A
		N/A

SEGMENT #	TITLE	DESCRIPTION
29	Pick Tool	Show array of tools + select screw driver
	STILL	AUDIO
	VIDEO	
	N/A	<p>TOOL SELECTION</p> <p>AUTOM 300</p> <p>start 1.2.2 stop 1.2.2 min</p> <p>actual 1.2.2 1.2.2 1.2.2 min</p> <p>start 1.2.2 stop 1.2.2 min</p> <p>actual 1.2.2 1.2.2 1.2.2 min</p> <p>start 1.2.2 stop 1.2.2 min</p> <p>actual 1.2.2 1.2.2 1.2.2 min</p>

SEGMENT #	TITLE	DESCRIPTION
30	Continue Prompt	
	STILL	AUDIO
	VIDEO	
	<div style="border: 1px solid black; padding: 5px;">           S500            HIT            "return" OR            SAY            "page"            TO CONTINUE         </div>	N/A
		N/A

Figure 5.- Continued.

SEGMENT #	TITLE	DESCRIPTION	STILL	AUDIO	VIDEO
31	Board Access	Title of Procedure			
			<div style="border: 1px solid black; padding: 5px;">           \$600            BOARD            ACCESS            &amp;            REMOVAL         </div>	N/A	N/A

SEGMENT #	TITLE	DESCRIPTION
32	Board Removal	Remove Computer top + then board
	STILL	AUDIO
		VIDEO

SEGMENT #	TITLE	DESCRIPTION
33	Continue Prompt	VIDEO
	STILL	AUDIO
	<div style="border: 1px solid black; padding: 5px;"> S50  HIT  "return" OR  SAY  "page"  TO CONTINUE </div>	N/A
		N/A

Figure 5.- Continued.

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SEGMENT #	TITLE	DESCRIPTION
34	Board Replacement	Title of Procedure
	STILL	AUDIO
	<div style="border: 1px solid black; padding: 5px;">           S700 BOARD REPLACEMENT         </div>	N/A
		N/A
35	Replacement Procedure	Insertion of Memory board
	STILL	AUDIO
	N/A	<p>START 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 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1016. 1017. 1018. 1019. 1020. 1021. 1022. 1023. 1024. 1025. 1026. 1027. 1028. 1029. 1030. 1031. 1032. 1033. 1034. 1035. 1036. 1037. 1038. 1039. 1040. 1041. 1042. 1043. 1044. 1045. 1046. 1047. 1048. 1049. 1050. 1051. 1052. 1053. 1054. 1055. 1056. 1057. 1058. 1059. 1060. 1061. 1062. 1063. 1064. 1065. 1066. 1067. 1068. 1069. 1070. 1071. 1072. 1073. 1074. 1075. 1076. 1077. 1078. 1079. 1080. 1081. 1082. 1083. 1084. 1085. 1086. 1087. 1088. 1089. 1090. 1091. 1092. 1093. 1094. 1095. 1096. 1097. 1098. 1099. 1100. 1101. 1102. 1103. 1104. 1105. 1106. 1107. 1108. 1109. 1110. 1111. 1112. 1113. 1114. 1115. 1116. 1117. 1118. 1119. 1120. 1121. 1122. 1123. 1124. 1125. 1126. 1127. 1128. 1129. 1130. 1131. 1132. 1133. 1134. 1135. 1136. 1137. 1138. 1139. 1140. 1141. 1142. 1143. 1144. 1145. 1146. 1147. 1148. 1149. 1150. 1151. 1152. 1153. 1154. 1155. 1156. 1157. 1158. 1159. 1160. 1161. 1162. 1163. 1164. 1165. 1166. 1167. 1168. 1169. 1170. 1171. 1172. 1173. 1174. 1175. 1176. 1177. 1178. 1179. 1180. 1181. 1182. 1183. 1184. 1185. 1186. 1187. 1188. 1189. 1190. 1191. 1192. 1193. 1194. 1195. 1196. 1197. 1198. 1199. 1200. 1201. 1202. 1203. 1204. 1205. 1206. 1207. 1208. 1209. 1210. 1211. 1212. 1213. 1214. 1215. 1216. 1217. 1218. 1219. 1220. 1221. 1222. 1223. 1224. 1225. 1226. 1227. 1228. 1229. 1230. 1231. 1232. 1233. 1234. 1235. 1236. 1237. 1238. 1239. 1240. 1241. 1242. 1243. 1244. 1245. 1246. 1247. 1248. 1249. 1250. 1251. 1252. 1253. 1254. 1255. 1256. 1257. 1258. 1259. 1260. 1261. 1262. 1263. 1264. 1265. 1266. 1267. 1268. 1269. 1270. 1271. 1272. 1273. 1274. 1275. 1276. 1277. 1278. 1279. 1280. 1281. 1282. 1283. 1284. 1285. 1286. 1287. 1288. 1289. 1290. 1291. 1292. 1293. 1294. 1295. 1296. 1297. 1298. 1299. 1300. 1301. 1302. 1303. 1304. 1305. 1306. 1307. 1308. 1309. 1310. 1311. 1312. 1313. 1314. 1315. 1316. 1317. 1318. 1319. 1320. 1321. 1322. 1323. 1324. 1325. 1326. 1327. 1328. 1329. 1330. 1331. 1332. 1333. 1334. 1335. 1336. 1337. 1338. 1339. 1340. 1341. 1342. 1343. 1344. 1345. 1346. 1347. 1348. 1349. 1350. 1351. 1352. 1353. 1354. 1355. 1356. 1357. 1358. 1359. 1360. 1361. 1362. 1363. 1364. 1365. 1366. 1367. 1368. 1369. 1370. 1371. 1372. 1373. 1374. 1375. 1376. 1377. 1378. 1379. 1380. 1381. 1382. 1383. 1384. 1385. 1386. 1387. 1388. 1389. 1390. 1391. 1392. 1393. 1394. 1395. 1396. 1397. 1398. 1399. 1400. 1401. 1402. 1403. 1404. 1405. 1406. 1407. 1408. 1409. 1410. 1411. 1412. 1413. 1414. 1415. 1416. 1417. 1418. 1419. 1420. 1421. 1422. 1423. 1424. 1425. 1426. 1427. 1428. 1429. 1430. 1431. 1432. 1433. 1434. 1435. 1436. 1437. 1438. 1439. 1440. 1441. 1442. 1443. 1444. 1445. 1446. 1447. 1448. 1449. 1450. 1451. 1452. 1453. 1454. 1455. 1456. 1457. 1458. 1459. 1460. 1461. 1462. 1463. 1464. 1465. 1466. 1467. 1468. 1469. 1470. 1471. 1472. 1473. 1474. 1475. 1476. 1477. 1478. 1479. 1480. 1481. 1482. 1483. 1484. 1485. 1486. 1487. 1488. 1489. 1490. 1491. 1492. 1493. 1494. 1495. 1496. 1497. 1498. 1499. 1500. 1501. 1502. 1503. 1504. 1505. 1506. 1507. 1508. 1509. 1510. 1511. 1512. 1513. 1514. 1515. 1516. 1517. 1518. 1519. 1520. 1521. 1522. 1523. 1524. 1525. 1526. 1527. 1528. 1529. 1530. 1531. 1532. 1533. 1534. 1535. 1536. 1537. 1538. 1539. 1540. 1541. 1542. 1543. 1544. 1545. 1546. 1547. 1548. 1549. 1550. 1551. 1552. 1553. 1554. 1555. 1556. 1557. 1558. 1559. 1560. 1561. 1562. 1563. 1564. 1565. 1566. 1567. 1568. 1569. 1570. 1571. 1572. 1573. 1574. 1575. 1576. 1577. 1578. 1579. 1580. 1581. 1582. 1583. 1584. 1585. 1586. 1587. 1588. 1589. 1590. 1591. 1592. 1593. 1594. 1595. 1596. 1597. 1598. 1599. 1600. 1601. 1602. 1603. 1604. 1605. 1606. 1607. 1608. 1609. 1610. 1611. 1612. 1613. 1614. 1615. 1616. 1617. 1618. 1619. 1620. 1621. 1622. 1623. 1624. 1625. 1626. 1627. 1628. 1629. 1630. 1631. 1632. 1633. 1634. 1635. 1636. 1637. 1638. 1639. 1640. 1641. 1642. 1643. 1644. 1645. 1646. 1647. 1648. 1649. 1650. 1651. 1652. 1653. 1654. 1655. 1656. 1657. 1658. 1659. 1660. 1661. 1662. 1663. 1664. 1665. 1666. 1667. 1668. 1669. 1670. 1671. 1672. 1673. 1674. 1675. 1676. 1677. 1678. 1679. 1680. 1681. 1682. 1683. 1684. 1685. 1686. 1687. 1688. 1689. 1690. 1691. 1692. 1693. 1694. 1695. 1696. 1697. 1698. 1699. 1700. 1701. 1702. 1703. 1704. 1705. 1706. 1707. 1708. 1709. 1710. 1711. 1712. 1713. 1714. 1715. 1716. 1717. 1718. 1719. 1720. 1721. 1722. 1723. 1724. 1725. 1726. 1727. 1728. 1729. 1730. 1731. 1732. 1733. 1734. 1735. 1736. 1737. 1738. 1739. 1740. 1741. 1742. 1743. 1744. 1745. 1746. 1747. 1748. 1749. 1750. 1751. 1752. 1753. 1754. 1755. 1756. 1757. 1758. 1759. 1760. 1761. 1762. 1763. 1764. 1765. 1766. 1767. 1768. 1769. 1770. 1771. 1772. 1773. 1774. 1775. 1776. 1777. 1778. 1779. 1780. 1781. 1782. 1783. 1784. 1785. 1786. 1787. 1788. 1789. 1790. 1791. 1792. 1793. 1794. 1795. 1796. 1797. 1798. 1799. 1800. 1801. 1802. 1803. 1804. 1805. 1806. 1807. 1808. 1809. 1810. 1811. 1812. 1813. 1814. 1815. 1816. 1817. 1818. 1819. 1820. 1821. 1822. 1823. 1824. 1825. 1826. 1827. 1828. 1829. 1830. 1831. 1832. 1833. 1834. 1835. 1836. 1837. 1838. 1839. 1840. 1841. 1842. 1843. 1844. 1845. 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2012. 2013. 2014. 2015. 2016. 2017. 2018. 2019. 2020. 2021. 2022. 2023. 2024. 2025. 2026. 2027. 2028. 2029. 2030. 2031. 2032. 2033. 2034. 2035. 2036. 2037. 2038. 2039. 2040. 2041. 2042. 2043. 2044. 2045. 2046. 2047. 2048. 2049. 2050. 2051. 2052. 2053. 2054. 2055. 2056. 2057. 2058. 2059. 2060. 2061. 2062. 2063. 2064. 2065. 2066. 2067. 2068. 2069. 2070. 2071. 2072. 2073. 2074. 2075. 2076. 2077. 2078. 2079. 2080. 2081. 2082. 2083. 2084. 2085. 2086. 2087. 2088. 2089. 2090. 2091. 2092. 2093. 2094. 2095. 2096. 2097. 2098. 2099. 2100. 2101. 2102. 2103. 2104. 2105. 2106. 2107. 2108. 2109. 2110. 2111. 2112. 2113. 2114. 2115. 2116. 2117. 2118. 2119. 2120. 2121. 2122. 2123. 2124. 2125. 2126. 2127. 2128. 2129. 2130. 2131. 2132. 2133. 2134. 2135. 2136. 2137. 2138. 2139. 2140. 2141. 2142. 2143. 2144. 2145. 2146. 2147. 2148. 2149. 2150. 2151. 2152. 2153. 2154. 2155. 2156. 2157. 2158. 2159. 2160. 2161. 2162. 2163. 2164. 2165. 2166. 2167. 2168. 2169. 2170. 2171. 2172. 2173. 2174. 2175. 2176. 2177. 2178. 2179. 2180. 2181. 2182. 2183. 2184</p>



SEGMENT #	TITLE	DESCRIPTION	STILL	AUDIO	VIDEO
37	Reconnect System	Title of Procedure	<div><div>S800</div><div>RECONNECT SYSTEM</div></div>	N/A	N/A
38	Reconnect Procedure	Slow hook-up, step by step ending	<div><div>N/A</div><div>ORIGINAL PAGE IS OF POOR QUALITY</div></div>	<div><div>RECONNECT BY STEP</div><div>THE SYSTEM CABLES ARE NOW RECONNECTED</div><div>AND THE SYSTEM IS READY TO HAVE THE</div><div>MEMORY INSTALLED.</div></div>	<div><div>RECONNECT BY STEP</div><div>THE SYSTEM CABLES ARE NOW RECONNECTED</div><div>AND THE SYSTEM IS READY TO HAVE THE</div><div>MEMORY INSTALLED.</div></div>
39	End Step-by-Step	Ready to check memory again		A180 ends	<div><div>START</div><div>STOP</div><div>END</div></div>

SEGMENT #	TITLE	DESCRIPTION	AUDIO	VIDEO
40	Continue Prompt			
	<div style="border: 1px solid black; padding: 5px;">           550            HIT            "return" OR            SAY            "page"            TO CONTINUE         </div>	N/A	N/A	

SEGMENT #	TITLE	DESCRIPTION	AUDIO	VIDEO
41	Memory Check Procedure			
	<div style="border: 1px solid black; padding: 5px;">           5200            MEMORY            CHECK            PROCEDURE         </div>	N/A	N/A	

SEGMENT #	TITLE	DESCRIPTION	AUDIO	VIDEO

Figure 5.- Concluded.

## MOTION 300

## DIAGNOSTIC TEST (STEP-BY-STEP)

	start	: :	stop	: :	minimum	10:00	
actual	: *	SHOW SYSTEM AND <u>ZOOM IN</u> ON SPIDER					
	start	: :	stop	: :	minimum	5:	
actual	: *	SHOW SPIDER TO POWER THE SYSTEM UP AND SHOW THE DISK DRIVE ON					
	start	: :	stop	: :	minimum	3:	
actual	: *	SHOW THE COMPUTER OFF.					
	start	: :	stop	: :	minimum	5:	
actual	: *	SHOW THE BUSY LIGHT ON THE DRIVE TO GO OFF					
	start	: :	stop	: :	minimum	6:	
actual	: *	<u>ZOOM OUT</u> AND SHOW INSERT THE DISK.					
	start	: :	stop	: :	minimum	3:	
actual	: *	SHOW CLOSE DOOR					
	start	: :	stop	: :	minimum	3:	
actual	: *	<u>ZOOM IN</u> TO SHOW TURN COMPUTER ON					
	start	: :	stop	: :	minimum	3:	
actual	: *	SHOW THE READY PROMPT, RUN THE PROGRAM.					

## MOTION 301

## END DIAGNOSTIC TEST

	start	: :	stop	: :	minimum	5:	
actual	: *	<u>ZOOM IN</u> TO SHOW DISPLAY					

## MOTION 310

## DIAGNOSTIC TEST (CONTINUOUS)

	start	: :	stop	: :	minimum	15:	
actual	: *	<u>LONG RANGE VIEW</u> OF TURN ON SPIDER, INSERT DISK, TURN ON COMPUTER, RUN PROGRAM					

## MOTION 400

## POWER DOWN/DISCONNECT

	start	: :	stop	: :	minimum	↓:	
actual	: *	<u>LONG RANGE VIEW</u> OF REMOVE DISK					
	start	: :	stop	: :	minimum	↓:	
actual	: *	TURN OFF COMPUTER					
	start	: :	stop	: :	minimum	5:	
actual	: *	TURN OFF SPIDER					
	start	: :	stop	: :	minimum	5:	
actual	: *	<u>ZOOM IN</u> ON COMPUTER FOR DISCONNECT OF CABLES					

## HOOKUP

MOTION 600

	start	:	:	stop	:	:	minimum	<u>5</u> :
actual	:	*	<u>MEDIUM RANGE VIEW</u> OF OPEN THE COVER AND REMOVE					
THE TWO SCREWS								
	start	:	:	stop	:	:	minimum	<u>5</u> :
actual	:	*	REMOVE THE COVER					
	start	:	:	stop	:	:	minimum	<u>10</u> :
actual	:	*	THE PROPER BOARD MAY BE REMOVED.					

## BOARD REPLACEMENT/REASSEMBLY

MOTION 500

```

      start      : :      stop      : :      minimum 5:
actual : * PAN TABLE
      start      : :      stop      : :      minimum 1:
actual : * LONGE RANGE VIEW OF PICK UP A PHILLIPS HEAD
SCREW DRIVER
      start      : :      stop      : :      minimum 5:
actual : * ZOOM IN TO SHOW SCREW DRIVER

```

## SYSTEM

Figure 6.- Concluded.

SEGMENT:VIDEO: # LABEL:	TITLE	VIDEO SOURCE START FINISH	VIDEO FINAL START FINISH	AUDIO SOURCE START FINISH	AUDIO FINAL START FINISH	SPECIAL INSTRUCTIONS
T1	TITLE SLIDE	11:20:00 11:39:00	00:07:00 00:30:00	1A100 7:00:13 7:20:00	0:08:13 0:28:00	> 20 SECS., FADE TO BLACK
T2	SUSPECTED PROBLEM MENU	15:08:00 15:20:00	00:30:00 00:42:00	1A110 7:38:14 7:41:01	0:36:13 0:39:00	> 10 SECS., FADE BOTH
T3	MEMORY CHECK PROCEDURE	7:13:00 7:20:00	0:42:00 0:49:00	- - - - -	- - - - -	> 5 SECS., FADE BOTH
T4	PLAY OPTION MENU	7:33:00 7:40:00	0:49:00 0:56:00	1A110 7:38:14 7:41:01	0:52:13 0:55:00	> 5 SECS., FADE BOTH
T5	RUN DIAGNOSTIC TEST	8:55:00 9:00:00	0:56:00 1:01:00	1A230 9:39:20 9:45:20	0:58:00 0:01:04	FADE IN, INSERT AUD. PAUSE
T6	DIAGNOSTIC TEST	3:36:13 5:13:20	1:01:00 1:28:25	1A230 9:46:14 9:54:15	1:17:05 1:25:06	AUDIO PAUSE, NO FADE
T7	END TEST	2:15:16 2:26:27	1:28:25 1:45:05	1A230 9:55:00 9:58:06	1:38:05 1:41:11	AUDIO PAUSE, FADE OUT
T8	POWER DOWN PROCEDURE	9:15:00 9:20:00	1:45:06 1:50:06	- - - - -	- - - - -	> 3 SECS., FADE BOTH
T9	OFF/DISCONNECT	5:22:00 5:52:25	1:50:07 2:21:02	1A140 10:21:09 10:36:01	1:57:08 2:12:00	AUD/VID COORD., FADE BOTH
T10	TOOLS REQUIRED	9:34:00 9:39:00	2:21:03 2:26:03	- - - - -	- - - - -	> 3 SECS., FADE BOTH
T11	PICK TOOL	8:30:00 8:54:00	2:26:04 2:50:04	1A150 10:49:23 10:55:21	2:32:04 2:38:02	FADE BOTH
T12	BOARD ACCESS & REMOVAL	9:50:00 9:55:00	2:50:05 2:55:05	- - - - -	- - - - -	> 3 SECS., FADE BOTH
T13	REMOVAL	6:49:00 7:39:00	2:55:06 3:45:06	1A160 11:11:17 11:37:01	3:11:17 3:37:01	AUD/VID COORD., FADE BOTH
T14	BOARD REPLACEMENT	10:10:00 10:15:00	3:45:07 3:50:07	- - - - -	- - - - -	> 3 SECS., FADE BOTH
T15	REPLACEMENT	7:48:19 8:47:23	3:50:08 4:49:02	1A170 11:56:08 12:23:01	3:48:25 4:15:20	AUD/VID COORD., FADE BOTH
T16	RECONNECT SYSTEM	10:30:00 10:35:00	4:49:03 4:54:03	- - - - -	- - - - -	> 3 SECS., FADE BOTH
T17	RECONNECT	6:03:00 6:23:00	4:54:04 5:14:04	1A280 13:03:13 13:24:14	4:47:14 5:08:15	AUD/VID COORD., FADE BOTH
T18	SYSTEM VIEW	0:15:28 0:22:28	5:14:05 5:21:05	- - - - -	- - - - -	> 5 SECS., FADE BOTH
T19	PLAY OPTIONS MENU	7:30:00 7:37:00	5:21:06 5:28:06	1A110 7:38:14 7:41:01	5:22:14 5:25:01	> 5 SECS., FADE IN
T20	RUN DIAGNOSTIC TEST	8:50:00 8:59:00	5:28:07 5:37:07	1A130 7:57:02 7:57:02	- - - - -	AUD/VID COORD., FADE IN
T21	STEP-BY-STEP DIAG. TEST	0:30:08 2:13:29	5:37:08 7:20:29	1A130 7:20:29 1A135 15:20:00	15:25:00 7:24:00	7:29:00:FADE OUT
T22	END TEST	2:15:16 2:26:11	7:20:29 7:31:24	1A135 15:20:00 15:25:00	7:24:00 7:29:00	FADE OUT
T23	"return" TO CONTINUE	10:43:00 10:50:00	7:31:24 7:38:24	- - - - -	- - - - -	> 5 SECS., FADE BOTH
T24	MEMORY CHECK RESULTS MENU	11:03:00 11:10:00	7:38:25 7:45:25	1A110 7:38:14 7:41:01	7:39:14 7:42:01	> 5 SECS., FADE BOTH
T25	POWER DOWN PROCEDURE	9:05:00 9:10:00	7:45:26 7:50:26	- - - - -	- - - - -	> 3 SECS., FADE BOTH
T26	OFF/DISCONNECT	5:22:00 5:52:25	7:50:27 8:21:22	1A140 10:21:09 10:36:01	7:58:12 8:13:04	AUD/VID COORD., FADE BOTH
T27	"return" TO CONTINUE	10:45:00 10:50:00	8:21:22 8:26:22	- - - - -	- - - - -	> 3 SECS., FADE BOTH
T28	TOOLS REQUIRED	9:25:00 9:30:00	8:26:22 8:31:22	- - - - -	- - - - -	> 3 SECS., FADE BOTH
T29	PICK TOOL	8:30:00 8:45:00	8:31:22 8:46:22	1A150 10:49:23 10:55:21	8:34:00 8:39:28	FADE BOTH
T30	"return" TO CONTINUE	10:45:00 10:50:00	8:46:22 8:51:22	- - - - -	- - - - -	> 3 SECS., FADE BOTH
T31	BOARD ACCESS & REMOVAL	9:45:00 9:50:00	8:51:20 8:56:20	- - - - -	- - - - -	> 3 SECS., FADE BOTH
T32	REMOVAL	6:50:00 7:39:00	8:56:18 9:45:16	1A160 11:11:17 11:37:01	9:12:16 9:38:00	AUD/VID COORD., FADE BOTH
T33	"return" TO CONTINUE	10:45:00 10:50:00	9:45:16 9:50:16	- - - - -	- - - - -	> 3 SECS., FADE BOTH
T34	BOARD REPLACEMENT	10:05:00 10:10:00	9:50:14 9:55:14	- - - - -	- - - - -	> 3 SECS., FADE BOTH
T35	REPLACEMENT	7:59:12 8:55:28	9:55:12 10:51:28	1A170 11:56:06 11:37:01	8:57:05 9:38:00	AUD/VID COORD., FADE BOTH
T36	"return" TO CONTINUE	10:45:00 10:50:00	10:51:26 10:56:26	- - - - -	- - - - -	> 3 SECS., FADE BOTH
T37	RECONNECT SYSTEM	10:25:00 10:30:00	10:56:24 11:01:24	- - - - -	- - - - -	> 3 SECS., FADE BOTH
T38	RECONNECT	6:03:00 6:23:00	11:01:22 11:21:22	1A180 12:36:28 12:48:21	12:08:28 11:20:21	AUD/VID COORD., FADE BOTH
T39	SYSTEM VIEW	0:15:28 0:31:19	11:21:20 11:37:11	- - - - -	- - - - -	FADE BOTH
T40	"return" TO CONTINUE	10:45:00 10:50:00	11:37:09 11:42:09	- - - - -	- - - - -	> 3 SECS., FADE BOTH
T41	MEMORY CHECK PROCEDURE	7:03:00 7:10:00	11:42:07 11:49:07	- - - - -	- - - - -	> 5 SECS., FADE BOTH

Figure 7.- Tape Assembly Script.

# Standard Bibliographic Page

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16. Abstract Video disk technology is one of the central themes of a technology demonstrator workstation being assembled as a man/machine interface for the Space Station Data Management Test Bed at Johnson Space Center. Langley Research Center personnel involved in the conception and implementation of this workstation have assembled a video production facility to allow production of video disk material for this purpose. This paper documents the initial familiarization efforts in the field of video production for those personnel and that facility. Although the entire video disk production cycle was not operational for this initial effort, the production of a simulated disk on video tape did acquaint the personnel with the processes involved and with the operation of the hardware. Invaluable experience in storyboarding, script writing, audio and video recording, and audio and video editing was gained in the production process.					
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